SPIDERS AND SCORPIONS

F. MARTIN DUNCAN AND L. T. DUNCAN

WONDERS OF INSECT LIFE

Mr. John C. Charyk left our school on June 1936 with a farewell party for him on June 29 by the Senior High School Room.

40, 40, 40.

THE ORCHID SPIDER CATCHES A FLY
(THE SPIDER LOOKS JUST LIKE A FLOWER BUD).

[*See Page* 66.

WONDERS of INSECT LIFE

F. MARTIN DUNCAN
F.R.M.S. F.R.P.S.
& L. T. DUNCAN

SPIDERS AND SCORPIONS

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CONTENTS

CHAP.		PAGE
I.	What a Spider is like—Its Legs, Shape and Eyes — The Spider's Spinning Machine—Poison Fangs . .	7
II.	The Spider at Home—The Garden Spiders—How the Spider weaves her Web	13
III.	The Ways of the Diadem Spider—Her poor little Mate—Her Egg-cocoon—Spiders' Silk	22
IV.	Spider Nurseries—Cocoons—The "Fairy-lamp-maker"—The Banded Spider's Egg-cocoon — Careful Mothers — A Spider Pie	28
V.	Young Spiders—Strange little Babies—Spider Families—Bad Behaviour—A Spider's Aeroplane—How a Spider changes its Coat . . .	34
VI.	Spiders' Webs — Orb-weavers — The Banded Spider's Web — A Battle Royal—Triangular Webs—A Spring Trap—Sheet-webs—Big Webs .	43

CHAP. PAGE

VII. Spiders' Homes—Cave-dwellers—Trap-door Spiders—Their Wonderful Nests—The Turret Spider . . 50

VIII. Hunting Spiders—Wolf Spiders—Jumping Spiders—Monster Spiders—The Tarantula 56

IX. Base Deceivers—Cunning Spiders—The Orange Spider—The Orchid Spider—The Grass Spider—Curious Spiders 63

X. "Stinging-tail" and "Hundred-legs"—The Scorpion—The Whip Scorpion—False Spiders—Harvest-men—Centipedes and Millipedes . . . 71

CHAPTER I

WHAT A SPIDER IS LIKE

To begin with I must tell you that Spiders are not insects. But they are such curious and interesting little folk, and play such an important part in the insect world, that I think they deserve a place in the "Wonders of Insect Life."

People are not very fond of Spiders as a rule. Many small folks and "grown-ups," too, call them "horrid things," and, like little Miss Muffet, are dreadfully frightened if a big Spider suddenly pops down beside them. But no one need be afraid of Spiders, for although they are indeed most terrible ogres to the little insect people, only a very few will do us any harm; with the exception of one or two great monsters living over the sea, Spiders are perfectly harmless to human folk. Spiders are really most interesting little creatures. They are wonderfully intelligent and industrious, and have

many amazing ways; and, although they are often called "ugly," many Spiders are really very handsome.

Let us first consider what a Spider is like, and in what way it is different from a true insect, and then we will pay a visit to "Spider-land" and take a peep at some of the Spiders in their own homes and find out how they live and what they do. And then, as Mrs Spider herself remarked to the fly when she politely invited it to "walk into her parlour": "I have many curious things to show you when you're there."

The first thing we shall notice when we look at one of our Spider friends is that it has eight legs—and this at once tells us that a Spider cannot be an insect, for no true insect (when it is a grown-up, perfect insect) ever has more than six.

Then a Spider is divided only into two distinct parts, and not into three like an insect, for there is no division between a Spider's head and shoulders.

By its shape and the number of its legs we can at once distinguish a Spider from an insect; but there are other differences between these little creatures that are not

so plainly seen. For instance, an insect breathes by a net-work of air-tubes running all over its body; but a Spider, besides these air-tubes, has generally two or four little "lung-books" to help it to breathe as well.

A SPIDER'S FACE.

Besides having eight legs most Spiders have eight eyes, like little sparkling beads arranged in two rows on the front of their heads. They are not like the great compound eyes which most insects boast, but like the three simple eyes a bee has on her forehead, to light her way when she goes about her work in the hive.

Mrs Spider is a thorough little business-woman, and she carries about with her a useful set of tools to help her in her work. At the end of her body she has six spinning fingers, called "spinnerets," which make the most wonderful spinning machine in the world. These fingers are short and stumpy,

and the tips are rounded, and covered with quantities of little spinning tubes, or spools, with a tiny hole at the end of each one, through which the silk comes out.

The Spider's silk is not rolled up in a ball inside her, it is quite liquid until it comes in contact with the air, and each little spinning tube is connected with a tiny silk gland in which this liquid silk is formed. The Spider can use just as many of the spools as she likes at a time, and so vary the thickness of her threads and the quality of the silk. She has three different kinds of silk, and she always uses the particular kind best suited to her work—whether she is making a snare to catch her prey, weaving a soft cocoon to shelter the baby Spiders, or spinning a strong rope by which she may swing herself down to the ground.

A SPIDER'S SPINNERETS.

On her feet the Spider has the most beautiful little claws, like tiny combs. With these she carefully combs herself, and keeps her-

self neat and trim—for a Spider is a most particular little person and never neglects her toilet. The claws are used, too, to seize and hold prey, but their most important work is to guide and arrange the silken threads when the little spinner is weaving her snare or her cocoon.

A SPIDER'S FOOT.

We must not forget the Spider's jaws. They are really terrible fangs, hard and sharp and pointed. They are hollow, too, and have a tiny hole near the tip through which the poison, from a poison gland at the base of the jaw, is poured out when the Spider buries her fangs in a struggling victim, or in one of her own relations with whom she has had a difference of opinion, for Spiders are very quarrelsome and quick-tempered little folk, ready to fight on the least provocation. Sad to say, Spiders are cannibals too, and make no bones of

eating one another if they happen to fall out.

Spiders have no antennæ as insects have; instead, they have a curious pair of feelers like an extra pair of little legs. They are called "palps," and they end in little hooks which remind one rather of the hook on a wooden arm. The Spider often uses her palps as hands, and with the hooked ends she holds her victim when she is having her dinner.

Spiders do not go through the same wonderful transformations as insects. A Spider is always a Spider throughout its whole life. Instead of being first a larva and then a pupa before it gains its true shape, a baby Spider is a tiny copy of its parents, although at first it has not always its right number of legs, and there are one or two other small differences, as we shall see by and by.

CHAPTER II

THE SPIDER AT HOME

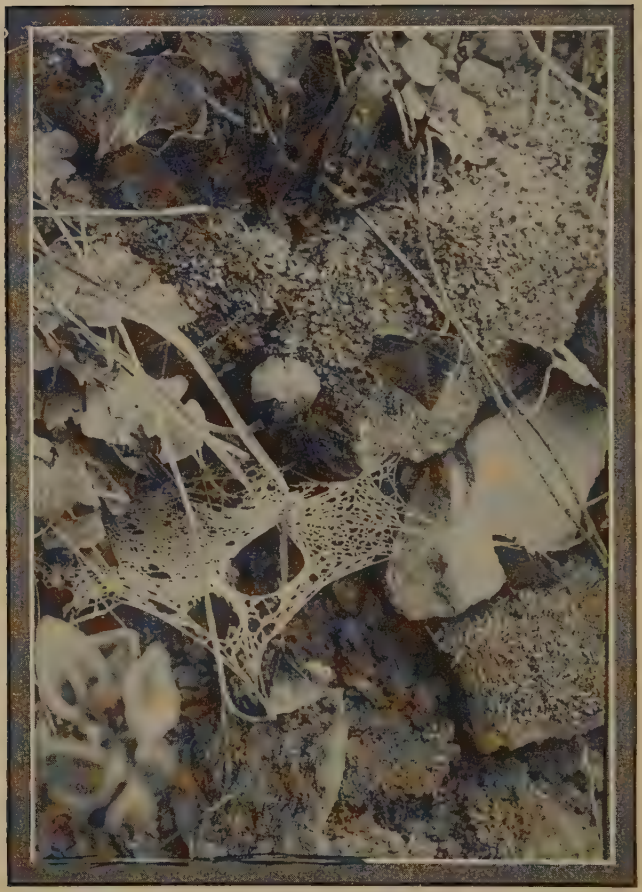
We need not take a long journey when we pay a visit to "Spider-land." Towards the end of summer every hedgerow in the lane, every clump of gorse on the common, every thorn bush growing on the banks of pond and stream is sure to be adorned with the beautiful handiwork of the tiny spinners. Indeed, we have seldom to go farther than our own garden to find the "Spider at home," sitting proudly, head downwards, in the middle of the wonderful web she has slung between the rose bushes or in the corner of an ivy-covered wall.

The Garden Spiders belong to a very large family of spiders called "Orb-weavers," which are distinguished by the beautifully regular, round webs they weave. Two or three of these clever little spinners are almost sure to be found in every garden, the most common being the small Garden Spider that spins a tiny fairy-like web, no bigger than a saucer, and the handsome

Diadem Spider whose web is often as large and round as a dinner-plate.

A Spider's web never looks more lovely than when it is covered with hundreds of dewdrops, all sparkling in the morning sun. But to see this pretty sight we must be up betimes, and run out very early into the garden, as long before the dew has gone from off the leaves and grass the Spiders' webs will have lost their glittering drops. For although the dewdrops look so bright and pretty, the Spider does not admire them—they make her web far too conspicuous to please her taste. So long as the pearly drops shine and sparkle in the sunshine the fine threads of the web are plainly seen, no fly will come near it, and Madam Spider must needs go hungry. So as soon as she wakes from her slumbers, she comes out from beneath the shelter of the leaf, where she has passed the night, rushes down to the middle of the web, and with a few quick jerks sets it swinging—and in a twinkling every flashing dewdrop is shaken off. Then up to her shelter the Spider runs again and sits down patiently to wait for breakfast.

A SPIDER'S WEB COVERED WITH DEWDROPS



SPIDER'S WEB COVERED WITH HOAR-FROST

Spiders as a rule are very early risers; most of them are hard at work long before the rest of the world is well awake, setting their traps in order for the day. Some Spiders even sit up at night to weave their webs, so that they may be ready to catch the first fly who ventures abroad in the morning.

When starting to weave her web the Spider first of all lays down several strong foundation lines. Clinging by her legs to a leaf or twig on the bush she has chosen for her hunting-ground, she pays out a long line of silk from her spinnerets and lets the wind waft it away. The light thread soon becomes caught in the foliage, and the Spider—after giving it a little tug to see that it is safely anchored—next passes backwards and forwards two or three times over this slender bridge, strengthening it as she goes with more silk from her little spinning machine.

She spins four or five foundation lines, fastening them to convenient points here and there on the bush, and bracing them with shorter lines to the leaves and twigs round about to prevent sagging. She is

very careful to see that these first lines are strong and well secured, for her web must be able to bear the blowing of the wind, the pattering of the rain, and the strain of heavy insects flying into it, without being carried away.

Some Spiders, instead of trusting the first foundation line to the breeze to carry it where it will, prefer to fix it themselves to some particular spot, so creep over the bushes dragging their thread behind them and fasten it in position by hand. For Spiders are by no means all exactly alike in their ways, they vary in character just as human folks do, and each one has her own ideas of the best way of setting to work.

Having fixed her foundation lines to her satisfaction, the industrious little spinner next proceeds to stretch several threads across from one to another so that they all meet in the centre like the spokes of a wheel —and the framework of her web is complete.

Her next care is to bind the spokes of the wheel firmly together in the centre by twisting a few strands of silk round and round them, and so making a kind of little lace button to form the hub of her web.

Then starting from this point the Spider works in a spiral thread with rather a wide space between each ring.

But her work is not finished yet. These first rings are only a kind of scaffolding to which the Spider may cling while she weaves the most important part of her snare. If it were left as it is she would catch nothing, for the flies would pass gaily between the open rings and away.

So far the Spider has worked with firm, dry threads, but now she uses a different kind of silk from her spinnerets. It is very fine and elastic, and coated all along its length with a kind of sticky glue. Beginning now at the outer edge of her web the Spider moves slowly upwards, swinging herself along the scaffolding lines with the claws on her front legs, and fastening the thread to each spoke of the wheel as she passes. She draws the thread from her spinnerets with her hind legs, stretching it as tight as she can and then letting it go with a snap as she fixes it in place. This causes little sticky blobs of gum to form all along the line, so that it looks like a row of tiny beads strung closely together on a thread. It

is these sticky threads which hold fast any unlucky insect that falls into the web. If even the tip of a fly's wing brushes against them the poor thing cannot get away, for it is gummed fast to the web and all its struggles only entangle it more and more.

Round and round the Spider travels, putting in her sticky threads. She never seems to hurry, yet as she wastes no time but goes steadily on with her work, it is not very long before she reaches the little lace button in the centre of the web again. From start to finish the building of her web usually takes the little spinner no more than an hour.

Mrs Spider does not live in her web. This is only the trap to catch her food. Her house is a little, closely woven, silken cell, generally hidden under the shelter of a leaf, and connected with the large web by a stout silken cord. At night the Spider always sleeps in this little home; but in the day-time she passes part of her time in the centre of the web, with her eight legs spread out all round grasping the spokes of the wheel, and part of her time upstairs, with one foot on the cord so that she may know by its shaking when there is any disturbance in

WAITING FOR A FLY.

the web. For, in spite of her eight eyes, the Spider is very short-sighted, and it is chiefly by touch that she knows when an insect has tumbled into her snare.

Directly the cord shakes, Mrs Spider is out, and down her rope in a flash, impatient to see what she has caught for dinner. If it happens to be a small fly she springs at it, as if she were in a violent rage with the poor little thing, quickly twists a few threads round it and nips it with her jaws; and in next to no time she has sucked her victim dry—nothing is left of it but an empty skin.

But if a big blue-bottle or a great drone-fly has blundered into her web, and is plunging about and breaking and spoiling her beautiful neat work, Mrs Spider is greatly excited and angry. Rushing at the loudly buzzing, frightened insect, she pours a regular sheet of silk over it from her spinnerets; at the same time twisting the poor thing round and round with her hind legs until it is completely wound up from head to tail in a clinging, silken sheet, and can struggle no more.

In warm, sunny weather the Spider is kept busy all day long with the constant

succession of flies and other insects that fall into her snare; and although she is a very greedy creature she often finds she has more food than she can possibly eat. But she does not believe in wasting good things, so when she has satisfied her hunger the Spider covers her victims with a winding sheet, and thoughtfully stores away as many as she can in her larder under the leaf, for a rainy day.

The Spider's web is, of course, often torn by the wind or broken by the large insects that fall into it. The rain, too, washes away the sticky beads from the cross lines, and the Spider has plenty of work to do to keep her web in good repair. The framework of a web will last for quite a long time with a little patching here and there, but the fine sticky threads must be constantly renewed. So every morning and evening, and all through the day at odd times when she has nothing else to do, we may see the hard-working little Spider busily mending her web.

CHAPTER III

THE WAYS OF THE DIADEM SPIDER

THE Diadem Spider is really very handsome. She is usually dressed in a soft shade of russet brown, and her broad back is adorned with white spots and splashes which often form a pattern in the shape of a cross. And from this mark she is sometimes called a "Cross Spider."

But although she is fine enough in appearance, the behaviour of the Diadem Spider is, I am sorry to tell you, anything but pleasing. To be sure she is most industrious, and generally very courageous, but she is terribly savage and bad-tempered, and the way she treats poor Mr Spider is perfectly disgraceful.

The male Diadem Spider is quite a little fellow. He is long and thin, and not half so fine and large as his portly mate. But he very much admires the big, handsome lady who sits so proudly alone in the middle of her splendid web. For hours he will wander forlornly round about the fringe

of her domain, timidly touching the outer threads of the web with his forelegs, as if he were tapping at her door. After some time, if Mrs Spider does not seem annoyed by this gentle tapping, but still sits quietly in the middle of her web, the little fellow

THE DIADEM SPIDER.

takes courage and begins very slowly and cautiously to climb up the rings of the web; but if she makes a sudden movement towards him, he skips off the ladder in the wildest alarm and flees for his life to a safe distance beyond her reach. And the poor little spider has good cause for fear, for if when he ventures near her Mrs Spider does

not like the look of him, or is not in the mood for visitors, she will promptly kill him and eat him on the spot, with no more ceremony than if he were a fly.

If, however, the lady Spider is not in quite such a ferocious humour, she may allow the little male to remain near her without gobbling him up; and he may then spin a small rough sort of web close by his lady's home. He dare not be so bold as to attempt to live in the same house with her—the most he can hope for is to be allowed to pay her a visit now and then when she happens to be in a particularly good temper. But even then this strange partnership generally comes to a sad end, for sooner or later Mrs Spider is sure to grow tired of her poor little mate and eat him up for dinner!

I am glad to say that all lady Spiders are not so cruel as Mrs Diadem, though she is by no means the only one who treats her mate in such a heartless fashion. But the male Spider is often very much smaller than the ladies of the same family, and he runs a great risk of being killed, or having most of his legs bitten off, should he offend his hot-tempered dame. On the other hand,

there are some kinds of Spiders that are much more friendly in their ways towards each other, and Mr and Mrs Spider may

A SPIDER'S EGG-COCOON COVERED WITH LEAVES.

live quite peacefully together for some little time without quarrelling and eating each other up.

Strange to say, in spite of their fierce and cruel ways, Spiders, as a rule, are kind and thoughtful mothers, and many of them

make really beautiful little cocoons to protect their eggs from the sharp eyes of hungry birds, and the many prowling creatures who would be only too eager to devour them.

In these little silken cases, wrapped up in the softest, thickest quilt of fluffy silk, the Spider's eggs are safe, too, from the sudden changes of the weather. Cold and wind and rain cannot harm them; and when the baby Spiders come out of the eggs they find themselves in the cosiest nursery possible, where they will be quite safe and comfortable until they are strong enough to venture forth into the world.

Even the savage Diadem Spider wraps up her tiny, golden eggs in a large ball of the softest flossy silk, and this she tucks away in a crack in an old wall, under the loose bark of a tree, or any other odd corner where she thinks it will be perfectly safe.

The Spider uses a special kind of silk to form her cocoon. It is stronger than the thread with which she weaves her web, and often very brightly coloured. The Diadem Spider makes her little egg bag of bright yellow silk, which looks very much like silkworm's silk. To make the soft, quilted

blanket with which she surrounds her eggs the Spider pours out a regular shower of silk from her spinnerets—much as a shower of water is poured from the rose of a watering-pot. As the delicate silk streams forth the little spinner spreads it out with her hind legs, and combs it with the little claws on her feet into a heaped-up, fluffy mass, almost like a foam of silk. This she beats down and presses into shape with her legs, and then round and round it she winds a long thread, to form an outer coverlet, just as one winds a ball of wool.

Several attempts have been made to use the Spider's silk in the same way as silk-worms' silk; and many years ago, in France, some stockings and mittens were actually made from it. But although they were very beautiful, the Spider's silk mittens and stockings were no good except as curiosities, for they were much too fine and delicate for anyone to wear; and as it takes seven thousand Spiders to weave one pound of silk, people soon in despair gave up trying to keep these tiresome creatures. For the Spiders would not behave themselves, as the quiet-mannered silk-worms do, but

instead of attending to their work they were constantly quarrelling and eating each other up.

CHAPTER IV

SPIDER NURSERIES

The pretty little cocoons made by mother Spiders are not all alike in shape and size and colour. They vary as much as the nests of birds, and are even more wonderful than they are.

Each different kind of Spider has its own particular way of weaving the little egg-bag which is to protect the precious eggs and shelter the baby Spiders. And every little Spider in some marvellous way knows just what she has to do without being taught, and fashions her own cocoon in exactly the same way as her mother did before her.

The Diadem Spider weaves a soft ball of golden silk, while some of her relations make white silk cocoons to form dainty cradles for the baby Spiders. Other Spiders sling a silken hammock under a leaf, which

serves both as a screen to hide the cradle from prying eyes and an umbrella to keep off the rain. And while some Spiders just weave a loose, fluffy mass of silk, without any particular shape to hold their eggs, others take the greatest pains and trouble to mould their cocoons into all sorts of pretty shapes, and sometimes even trim them with coloured silk embroidery, or ornament them with pieces of leaves and grass, tiny flowers, or the wings of flies and beetles. But I expect the little mother does not cover her cocoon with odds and ends so much with the idea of making it look pretty, as the better to hide it from the eyes of prowling foes.

For the same reason some Spiders, after making the daintiest silken caskets for their eggs, plaster them all over with mud (much in the same way as the Mason bees do their nests) so that their work is completely hidden and looks only like a little, dry clod of earth.

One of these little Mason Spiders is called the "Fairy-lamp Maker," because the pretty little casket she weaves of glistening white silk looks, when it is first made, like a tiny

Japanese lantern as it swings on a slender stem from the heather or grasses. But the brightness of this fairy-lamp is soon obscured, for directly it is finished the Spider daubs it all over with mud. She climbs up and down the stem on which she has hung her "lamp," patiently fetching and carrying pellet after pellet of damp earth, with her legs and jaws, and plastering them all over her pretty cocoon.

With her tiny, hand-like palps and her useful fore feet mother Spider carefully smooths and presses the earth pellets into position, turning herself about from time to time to wind a few threads from her spinnerets round her work, to prevent the muddy covering from being washed away by future showers of rain; and at last when her plastering is finished, few would guess that the little lump of dried mud concealed the pretty nursery of forty or fifty baby Spiders.

One of the most beautiful little egg-bags is made by the "Banded Spider," a European relation of our garden Diadem Spider. She is a handsome Spider, and has gained her name from the bands of yellow, black

and silver which encircle her large, round body.

The outer covering of her little egg-bag is formed of glistening white silk, so closely woven as to resemble the softest satin. In shape it is like a tiny balloon about the size of a pigeon's egg, and it is ornamented at the upper end with ribbons of black and brown silk laid on in a wavy pattern.

The little satin balloon is suspended upside down amongst wild grasses growing on marshy ground, or near a stream of water, and is held securely in place by several short silken cords. Inside it is fitted with a wading of soft reddish brown silk, all puffed out into a fluffy mass, and safe and warm in the midst of this cosy blanketing lie the Spider's eggs.

A thick pad of white silk is fitted into the neck of this little balloon and finished off with a scalloped edge, and so well and strongly is this wonderful little cocoon made that neither frost nor rain can penetrate within and harm the tiny golden eggs which lie hidden in their cosy blanket.

Most mother Spiders, when their work is finished, consider that they have done

all that is necesary for the protection of their young. So they leave their cocoons to their fate and wander away, and soon afterwards, worn out with their toil, the little creatures usually die. Yet some Spiders do not desert their cocoons, but watch over them with the greatest care until the spiderkins are hatched, and are able to make their own way in the world.

Some Spiders do not believe in putting all their eggs in one basket, so, instead of weaving one big cocoon, they make several tiny ones and put a few eggs in each.

The little Tailed Spider of America is one of these cautious mothers. She spins a number of tiny cocoons about the size of peas, and strings them all together like a row of beads in one of the upper sections of her round web, where she can keep an eye on them and protect them from harm.

Another Spider weaves a pretty little silken tent to shelter her cocoons, and covers it with all sorts of curious things to hide it from view—such as pieces of straw, bits of stick, grains of earth or mortar, or dead leaves. The top part of the tent she makes her nursery. Here she fastens the tiny

yellow-silk balls which contain her eggs; while she herself lives in the lower part of the tent and remains on guard until the eggs are hatched. The baby Spiders do not at once leave this comfortable little home, but stay for some weeks with their kind mother who shares with her children all the food she catches.

Spider's egg cases are sometimes the most peculiar shapes. Some are like tiny wine-glasses, others like little peaked, goblins' caps, others have the outer silken cover twisted up into strange little horns and knobs. One mother Spider even makes her cocoons exactly like little yellow pie dishes, and after filling them with eggs packed up in soft wadding, she covers them in with a little lid, like the crust of the pie.

A SPIDER PIE.

When the baby Spiders come out of the eggs and begin to expand they soon find their strange nursery too small for them, and as they press against the lid it gives way and opens—and all the little Spiders come tumbling out of the pie!

I am sure if a "Spider pie" were "set before a king" it would be just as much of a surprise as the famous pie full of "four and twenty blackbirds."

Sing a song for sixpence,
A pocket full of rye,
Sixty little spiders packed in a pie.
When the pie was opened,
The king said, '*How* absurd!'
But wasn't it a dainty dish for any hungry bird?

CHAPTER V

YOUNG SPIDERS

A BABY Spider when it first comes out of the egg is a tiny speck of a thing. But small as it is, it *is* a Spider, and not a caterpillar or a grub like a newly hatched insect. At first the baby Spider is very feeble and helpless. It can neither eat nor spin, for it is completely wrapped up, from top to toe, in a little white nightgown which covers its head and its spinning tubes and every part of it. So the baby Spider lies still in its nice, warm nursery and cuddles up close to its brothers and sisters.

As it rests there so snugly the wee spiderkin grows stronger. In a day or two it begins to feel restless and tired of staying in such a crowded nursery. But it cannot very well go out in the world wrapped up in a nightgown, so the young Spider proceeds to push and kick it off with its absurd little hind legs; and after a short and violent struggle the tiny creature is free.

A BABY SPIDER.

Once free from its wrapping the young Spider makes its way out of the nest without further delay, and if mother Spider is close at hand she will often help her children to escape from the cocoon by tearing it open with her feet and jaws.

Many families of young Spiders keep together for a week or more after they have left the cocoon; for the most part clinging tightly together in a ball for warmth. For Spiders are chilly folk, and no doubt the babies at first miss the nice warm blankets they have left behind in the nursery.

In the early autumn we may often come across such a ball of baby Spiders in some hedge or bush in the field or garden, but touch it ever so lightly, or gently shake the bough on which it rests, and the ball instantly breaks up into a hundred or so of wee, black and gold spiderkins who scatter in all directions—often looking, as they fall, like a shower of golden rain.

Young as they are, instinct teaches the little creatures what to do when danger threatens, and they know they are much safer when they are separated than when they are all huddled up together. But wait a little while, and you will see the "Spider ball" gradually form again, for the cunning little spiderkins have taken the precaution to spin fine lines in all directions round about, and along these lines they soon all come hurrying back to the same spot as before.

While they live together in this "happy family" way the young Spiders do not trouble to catch anything for dinner. They are not yet able to feed. The dewdrops and the moisture on the leaves furnish them with all the nourishment they require.

But this peaceful state of affairs does not continue very long; sooner or later the young Spiders grow hungry and begin to look about for food; and, sad to say, if this is not forthcoming the naughty little things before very long begin eating one another! Of course after that they cannot live happily together, and so each little spiderkin wanders away to set up housekeeping on its own account.

Now if the young Spiders all set to work to build their snares quite close together, they would most probably often have to go hungry, for it could hardly be expected that there would be enough insects to "go round" in a colony of perhaps several hundred Spiders. No, if they wish to live well and prosper, the Spiders must seek new hunting-grounds as far away as possible from one another.

But a Spider has no wings, so it cannot fly away, like an insect, from its old home, and in these early days it is such a tiny thing that its legs could not be expected to carry it far afield. But a Spider has no idea of trusting to its eight legs when starting off on a journey. Although it has no

wings it intends to fly, so it sets about making an aeroplane of its own to carry it through the air.

First the young Spider climbs to the highest spot it can find round about—the topmost twig of a bush, a gate-post, a wall or fence, or for want of anything better a tall grass stem. When it has reached the very tip-top of whatever it happens to be, the Spider turns about so as to face the wind, then standing on tip-toe it straightens all its legs, raises the end of its body as high as it can in the air and begins to spin a stream of silk from its little spinnerets.

GETTING READY TO FLY.

The fine silken ribbon is caught by the breeze and wafted gently away. Still the little spinner pays out its lines, and the

threads grow longer and longer until at last they begin to tug at their anchor; then, as soon as the Spider feels by the pulling of the silk that its craft is strong enough to bear its weight, it suddenly lets itself go, and, seizing the threads with its legs, mounts its aeroplane and starts off on a voyage of discovery through the air.

In the springtime and in the early autumn (what time the young Spiders are hatched)

OFF IN HIS AEROPLANE.

we may sometimes see hundreds of baby spiderkins crowded together on the top of a fence or the topmost bar of an iron railing, all getting ready to fly. On a warm day in the early morning or evening the air is often full of these "gossamer" threads which wind themselves round our faces and spread themselves over everything; and the grass and hedges are covered with patches of

finest lace-work, as if the fairies had hung out their curtains to dry.

The little Spiders as they sail through the air are not altogether at the mercy of the wind. They can haul in their threads or lengthen them, and so rise and fall in the air as they please. Of course the fairy-like aeroplanes are always catching in the trees, or getting entangled in something or other, and a young Spider may then decide to stay and spin its web there; but if it does not care for the situation it just cuts itself adrift and goes floating on to another place. The little air-craft may travel ever so far, and baby Spiders are sometimes carried right out to sea, and when they finally cast anchor may find themselves on a foreign shore. But that does not disturb the Spider, it is quite content so long as there is "good hunting" to be had, so it settles down wherever it may happen to find itself, and at once sets to work to weave a little snare on exactly the same pattern as its mother did before it.

As the Spider grows it casts its skin several times. Altogether it usually has nine new coats before it is quite grown up. The first

skin, which covers its mouth and its spinnerets, the baby Spider usually gets rid of before it leaves the nest without so very much difficulty; but after the first moult changing its coat is rather a serious business to the Spider. For a day or two beforehand it eats nothing, and I expect feels very uncomfortable, poor thing; then it fastens all its legs together with silk and hangs itself upside down from its web. Soon the old skin splits down the sides, and then the Spider kicks and struggles with all its might, until at last it wriggles right out of its skin and leaves it hanging above, looking just like a dried-up Spider.

After this performance the poor Spider feels very weak, and hangs limp and helpless, clinging to its web, for a quarter of an hour or so while its new coat hardens. It may even happen that during the struggle to free itself from its old skin the Spider may lose a leg or two; but this is not quite such a serious accident as it may appear, for although for a time the Spider must go short-handed, next time it has a new coat its lost legs will be replaced.

Of course all baby Spiders do not grow

up. Directly they leave the shelter of the nest they are surrounded by dangers on every side. A thunderstorm will often kill a whole family of newly hatched spiderkins. Many die of hunger if they cannot quickly find a sufficient supply of food. Birds, toads, and many other wild creatures are always gobbling them up, and as if they had not quite enough enemies ready to destroy them the silly little creatures must needs eat each other. And this is the reason mother Spiders lay so many eggs, for out of a whole brood of perhaps six or seven hundred only one or two baby Spiders are likely to grow up to spin cocoons themselves.

And really it is a blessing they *don't* all grow up, for although to be sure Spiders are very useful in helping to kill off the troublesome flies, we do not want the whole country to be simply over-run with them.

CHAPTER VI

SPIDERS' WEBS

SPIDERS' webs vary quite as much as their cocoons. Each Spider family has its own way of doing things, and all sorts of clever traps and cunning devices for ensnaring unfortunate insects are to be found in "Spiderland."

The "Orb-weavers," to which the Garden Spiders belong, all make wheel-shaped webs, large or small according to the size of the little spinner. But even these differ in certain ways one from another.

The hot-tempered Diadem Spider always spins hers in a wonderfully regular open pattern; while her handsome, but no less savage cousin, the Banded Spider, finishes hers off with a little winding staircase running from the bottom to the centre of her web. This staircase is made with a broad, flossy silken ribbon worked in a zigzag pattern from ring to ring between two spokes of the wheel; and right in the centre of the web Mrs Spider lays down a small closely woven carpet on which she takes her stand,

head downwards, while she is waiting for dinner.

This zigzag ribbon is not worked in by the Spider simply as a decoration, but to give greater firmness to the web. She is out for big game. Locusts and Grasshoppers often hop into her snare, which, if it were not very strongly made, would give way under the furious kicks from their long hind legs. But the Spider is not daunted by the size or the kicks of her captives. She circles round them and pours regular sheets of silk over the poor things until they are bound hand and foot, as we may say, and their hopping days are over.

Sometimes even a Praying Mantis, a cruel, bloodthirsty insect quite capable of turning the tables on the Spider if it gets the chance, is entangled in one of these ribbon-webs.

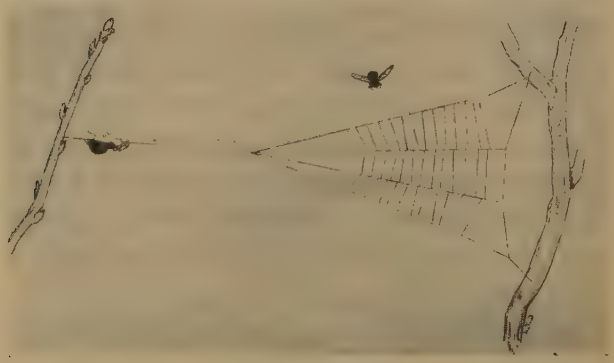
Then a tremendous battle takes place. The Spider dare not approach too near the Mantis while its terrible forelegs are free, or she may suddenly find herself clipped between their jagged teeth, and then—well, the Mantis will have a Spider for dinner instead of the other way round.

But warily the Spider waits until the claws

of the struggling insect have become more or less entangled in the meshes of her web. Then she cautiously draws nearer, and still keeping at a respectful distance from the Mantis' horrid "leg-traps," she showers her silk as fast as she can over the struggling insect. The Mantis plunges about and tries its hardest to reach the bold Spider; but, hampered by the winding sheets, it cannot get a leg free to give the fatal grip, and in nine cases out of ten the bold Spider will triumph. And really, when we remember all the poor little creatures that the cruel Mantis has deceived and devoured in its cunning way, I don't think we can feel particularly sorry for its fate.

Some Orb-weavers, instead of completing their webs in the usual way, leave out the sticky threads from one of the upper sections of the wheel. Through the centre of this open space runs the communicating cord, on which the little spinner keeps an attentive foot, while resting in her tent in some sheltered nook a few inches away from her snare, ready to pounce down directly the shaking of the cord tells her she has caught a victim in her web.

A very clever trap is made by the little Triangle Spider. It is rarely seen in England, but is quite common in the pine woods in certain parts of North America. The little Spider begins her work by laying down a strong foundation line, and from this she stretches four long lines which meet



A SPRING TRAP.

in a point, and so form a triangle. These four threads are connected by a number of short cross lines, not covered with sticky beads like the wheel-webs of the Garden Spiders, but all fluffed out by means of a number of short spines on the hind legs of the little weaver. To the point of the triangle is fastened a stout cord with the other end

fixed securely to something a little distance away; and on this the little spider takes her stand, in an upside down position, clinging to the cord with all her eight legs and

HOUSE SPIDERS.

hauling it in until the triangular web is stretched quite tight, and the slack part of the rope is coiled loosely between her front and hind legs.

When the trembling of the cord tells the little Spider that some insect has struck her net, she quickly lets go the rope with her fore legs, and the web springs back on

the poor thing and entangles it in the fluffy meshes. If an unusually large insect has been caught, and is plunging about in the web, the Spider springs her trap two or three times, hauling in the cord and letting it go again as quickly as she can so as to entangle it thoroughly.

The Sheet-weaving Spiders weave their webs so closely that they are almost like the finest muslin. To this family of spinners belong the hairy, long-legged Spiders which form those untidy cobwebs in the corners and on the ceilings of rooms that are not swept and dusted very often. Cobwebs are not at all pretty, they are always so ragged and dirty-looking; but this is not the fault of the Spiders, but of the smoke and dust with which they are covered.

A sheet web is a very different thing when it is first made by an out-of-door member of this family. Then it is snowy white, like a curtain of the finest silk muslin, fit for the fairies. But we seldom see it like this, for a sheet web is so delicate that the work which has cost the little Spider many hours of labour very soon becomes soiled and torn.

THE TARANTULA [*See Page* 62.

A GREAT TREE SPIDER

[*See Page* 60.

The hedges and banks of ditches are often covered with the webs of the little sheet weavers late in the autumn. They are rather a sorry sight as a rule—torn and covered with dust and all sorts of odds and ends. But when Jack Frost comes and touches them with his magic fingers they are once more beautiful, and sparkle in the sunshine as if they were covered with diamonds.

Some of the Spiders' webs in hot countries, in the Indian jungles, and the great forests of South America and Africa, are often enormous—as big as cart wheels, and so strong that sometimes small birds, mice, and young snakes are entangled in the meshes. But the Spiders who own these great webs do not intend to catch such prey. They live upon dragon-flies, locusts and grass-hoppers, and any other kind of insect which comes their way; and indeed I think they would much prefer that heavy animals did not blunder into their webs, for they only cause the mistress of the establishment a great deal of extra work in cutting them out and mending the rents in the net.

CHAPTER VII

SPIDERS' HOMES

All Spiders do not weave webs. But nearly every Spider has some kind of nest or retreat in which it lives or seeks shelter in time of danger; and these little dwellings often serve the double purpose of a home and an insect trap.

The Cave-dwelling Spiders are fond of making their homes in cracks in old walls. But they are not content simply to hide away there in the darkness. They build comfortable little houses of white silk within the cracks, shaped like little tubes or tunnels; and at the end of her cave the Spider lurks, patiently waiting for something good to eat to come her way.

Alas for the inquisitive little fly or beetle who ventures to explore this interesting-looking little cave! It finds that it has innocently walked right into an ogre's den, and never again will it come out into the sunlight.

Sometimes, however, the Spider has a

visitor she neither expects nor wishes for. Instead of a simple fly a fierce little solitary wasp may meet her on the threshold as she springs forward to see who is entering her den. And then a hot, fierce battle takes place between the bold little warrior and the cunning ogre. They are well matched. Each has a deadly, poisoned weapon—the wasp her sting and the Spider her fangs—so sometimes one and sometimes the other will come off conqueror. If the Spider wins the day she adds the wasp to her larder; but if the wasp is victorious the Spider is carried off in an insensible condition to provide a banquet for a baby wasp.

A great many Spiders live underground, in holes or tunnels lined with silk. They are shy creatures as a rule, and do not care to be seen about in the daylight; so while the sun is shining these burrowing Spiders lurk within their dens, and only venture abroad in search of prey after he has gone to bed.

Of all the underground dwellers in Spider-land none are more curious in their ways than the Trap-door Spiders. We shall not find these little creatures in England, as

our climate is much too cold to suit them; but in the sunny south of Europe and in other warm countries their wonderfully made nests are not at all uncommon.

The Trap-door Spider has very strong jaws, and with them she digs a tunnel in the ground several inches deep, and wide enough to enable her to turn round in comfort when she is within. The walls of her house she lines with hangings of the softest silk, and at the top of the tunnel she makes a perfectly fitting little door, with a hinge to keep it securely in place. Sometimes the door is a circular silk wafer which just flaps down over the entrance to the nest, and sometimes it is a thick, solid lid which fits the opening like a stopper.

NEST OF TRAP-DOOR SPIDER.

The Trap-door Spider never by any chance makes the door too large or too small. It always exactly fits the doorway of her house.

And how do you think it is that the clever little creature never makes a mistake in the size?

Well, if the Spider is going to make a wafer door she first entirely closes the entrance to her nest with a cover of silk, weaving several layers, one on the top of another, until she considers her door is as thick and as strong as she needs it. Then with her sharp jaws she clips away the cover all round the edge, except just at one point, where she leaves the silk still attached to form the hinge. And in this simple way the clever Spider contrives to make a perfectly fitting door without any troublesome measurements or calculations. When the door is to be like a stopper the Spider proceeds much in the same way, but in this case after weaving the first silken cover she plasters it over with earth—patiently fetching it grain by grain in her jaws and smoothing it carefully down with her forelegs. On the top of the earth she spreads another sheet of silk. And so she goes on adding layer after layer of earth and silk alternately, until the thick, solid stopper is made.

As the trap-door opens upwards, few creatures are able to pull it open from outside — particularly when Mrs Spider is holding it down inside with all her might, by clinging to the silk with the claws on her front legs, while with her hind legs she firmly grips the sides of the tunnel. And this is just what the Spider does when there is anyone knocking at her door whom she does not feel inclined to let in.

Many nests have a second door about half-way down the tube. So if while the front door is open an unwelcome guest should chance to drop in on Mrs Spider, she hastily retires to her lower room and slams the door in the intruder's face.

At night the Trap-door Spider sallies forth to hunt the many little insects who wander about in the darkness. One of these curious Spiders even spins a little web close to the ground at a little distance from her home, and when an insect blunders into the trap, she seizes it and carries it off to her den. Every morning before retiring for the day the Spider carefully clears the web away, and the next evening she makes a new one.

It is by no means easy to find the nests of the Trap-door Spiders, for the little creatures often take the greatest trouble to hide the entrances by attaching moss, leaves, or little pieces of stick to the top of the lids. Yet some Spiders are really very stupid about this; for if, after it has covered its nest with moss, the ground all round, including the trap-door, is cleared of moss, a spider will often take the trouble to fetch fresh moss from a distance, and then, of course, instead of *hiding* the nest the patch of moss on the bare ground makes it quite conspicuous.

Another member of the burrowing family, called the Turret Spider, builds a little round tower of twigs, pebbles, pine needles or grasses above the entrance to her nest. The turret is often two or three inches high, and is all bound round with silk to prevent it toppling over. As there is no door to her nest I suppose the Spider makes this little erection to prevent all sorts of creatures tumbling into it. She may often be seen peering over the top of her castle on the look out for prey, but quite ready to pop below should an enemy appear in sight.

The Turret Spider is a most attentive mother and keeps constant guard on her precious cocoon for two long months, carrying it about with her wherever she goes. Then when the little spiderkins are hatched they all climb up on their mother's back and cling to the soft hairs with which she is covered. And as there are rather more than a hundred babies, as a rule, it must be rather a troublesome task to nurse them all at once.

CHAPTER VIII

HUNTING SPIDERS

Although we have no true Trap-door Spiders in our country, we may often see some of their near relations, the "Wolf Spiders," running very fast along the ground in the meadows, and on common land where gorse and heather grow. The Wolf Spiders are regular hunters. They spin no snare, but chase their prey on foot and spring upon it as fiercely as the big four-legged hunters after whom they are named.

Some Wolf Spiders dig little burrows in loose earth or sand and line them with tubes of silk, but these homes are only roughly fashioned and have no doors. They are just little caverns where the Spiders rest after a hunting expedition, and private hiding-places into which they can pop when they themselves are chased by larger hunters. But some Wolf Spiders are regular vagabonds, leading a wandering gipsy life, and have no home of any kind.

These little Spiders are often seen running about with a large white ball clasped in their jaws, or fastened with silken threads to their spinnerets. These balls are their egg cocoons which the mother Spiders carry about with them wherever they go; and although they are often quite as large, or even larger, than the Spiders themselves, the strange little creatures do not seem to find their burdens at all inconvenient. A Wolf Spider may often be seen hotly pursuing its prey with its large white egg bag bumping merrily over the ground behind it, so the poor babies inside must be well shaken up when their mother goes a-hunting.

When the baby Spiders leave their nur-

sery they all climb up on to their mother's back, just as the little Turret Spiders do. There they stay for about a week and have the most exciting rides while Mrs Spider is scampering about after flies and little beetles, but as they do not want anything to eat during the first week of their life she does not give them any of the food she catches.

As soon as the young Spiders begin to feel hungry, they slip off their mother's back and each one starts hunting on its own account. Mrs Spider now thinks it is high time her children made their own way in the world, and if they do not quickly take their departure she makes them understand gently, but firmly, that she does not intend to carry them about any longer.

The Jumping Spiders are hunters too. They are funny little creatures, dressed in striped black and white suits, and, unlike most Spiders, they are very keen-sighted. They love warmth and sunshine, and are generally to be seen in the summer-time skipping merrily over the ground or jumping about on garden walls and fences.

A Jumping Spider always looks as if it had nothing particular to do and was just

playing about to pass the time away. But the cunning rogue is all the time keeping a sharp look-out for prey, and directly it spies a fly, or some other little insect, peacefully basking in the sun a little way off, it stops frisking about and creeps slowly and cautiously towards it, as a cat stalks a bird. Then as soon as it comes within leaping distance of the unsuspecting insect, with a sudden spring the little hunter bounds like a tiger right on the top of it.

Abroad, some of the male Jumping Spiders are most pretty little creatures, clad in all sorts of brilliant colours and adorned with wonderful crests and plumes. They are wonderful dancers too, and when, like the frog in the nursery rhyme, a spider "would a-wooing go," he dances and capers before the lady Spider of his choice to show her how pretty and clever he is and what a nice little partner he would make. If the lady Spider is pleased she may perhaps join in the dance, but if she looks cross the unlucky little gentleman may have to dance for his life; for if Mrs Spider does not admire his antics she is just as likely as not to gobble him up.

Some of the Hunting Spiders living in hot, tropical countries are enormous creatures—truly terrifying monsters, with huge hairy legs and bodies, and sharp, powerful jaws. One of these giant Spiders, called the Tree Spider, is two inches long, and spans seven inches with its thick, hairy legs. It makes its den in the cracks in trees, and stretches a thick curtain, like fine white muslin, across the entrance. Sometimes poor little humming-birds and finches are caught in the strong web and killed by the horrid Spider, but more often the monster preys upon the large insects that abound in tropical lands.

Other Spiders of the same kind do not live in trees, but lurk by day under stones or in some dark corner; and some dig deep burrows in the ground like slanting tunnels, often two feet long. Just before sunset these wicked-looking giant Spiders may be seen peering out of the tunnels, and as twilight falls they steal forth and prowl about in search of food.

Others make their homes under the tiles, or in the thatch, on the roofs of houses in some parts of South America, and at night

A MONSTER SPIDER.

they come into the rooms and crawl about over the walls, which certainly must be alarming to anyone lying in bed! Yet these dreadful-looking Spiders are not really harmful to man; and a traveller tells us that he once saw some Indian children leading one of these monsters about like a dog, by a cord tied round its waist.

There are monster Spiders, too, in Southern Europe, and amongst them is the famous "Tarantula," about which so many astonishing stories have been told. At one time, the bite of this great hairy creature was supposed to be deadly, and to make people dance madly until they fell down exhausted. But I need hardly tell you that these old tales are not true. As a matter of fact, the bite of the Tarantula, although it is certainly deadly to insects and many small animals, would not hurt a healthy man so much as the bite of a mosquito.

Really, although they look so terrible these great Spiders are not so much to be feared as some of the smaller ones. In New Zealand there is a little black fellow, about the size of a pea, whose bite is extremely painful and often causes fever.

The natives of New Zealand have a curious belief that to cure anyone who has been bitten they must find the Spider and kill it; and the foolish people will sometimes burn their house down, so as to make perfectly sure that the Spider has not escaped!

CHAPTER IX

BASE DECEIVERS

Spiders, as a rule, cannot be called "pretty creatures." Most of them are dull and dowdy-looking, many indeed are positively ugly, while others are such extraordinary shapes you would hardly think they were Spiders at all — but then the little people of Spider-land are all hard-working folk and do not trouble themselves about appearances. Yet there are exceptions to every rule, and even amongst these plain and unattractive creatures there are some that are really very handsome; and we may find several brightly coloured Spiders in our own gardens, and round about in the fields and hedgerows, if only we know

how to look for them. But Spiders, like insects and other little wild things, generally know so well how to hide themselves from prying eyes, that unless we are acquainted with their ways and manners we may pass them over again and again even when they are dressed in the gayest, brightest colours.

In the garden we may often find a pretty little Spider, about the size and colour of a green pea, on the rose bushes or other plants, where its bright colour matches the leaves so well that the tiny creature is practically invisible until it begins to move; and amongst the gorse and brambles on the commons, a beautiful orange-red Spider often makes her home; yet few people notice her in spite of her gay coat. As she swings herself down from a bough and dangles in mid-air at the end of a silken rope, the orange Spider is a most striking-looking lady, but when she sits quietly near her snare on a gorse bush she might easily be mistaken for one of the flowers, she is so much like them in size and colour.

Many of our eight-legged friends are always pretending to be something else.

AN ORANGE SPIDER

[*See Page* 64.

GIANT SPIDERS FIGHTING

There are actors in Spiderland just as there are in the insect world. For although they have not so much need of protection as feeble, unarmed insects, Spiders have many foes only too ready to snap them up whenever they have an opportunity. Birds and snakes and monkeys and lizards all eat Spiders, and ants and wasps often turn the tables on these insect ogres by carrying them off to their larders. Yet, as a rule, I fear these cunning Spiders are disguised not so much in order to avoid the notice of their enemies as to deceive their poor victims—the better to catch them and gobble them up, like the wicked wolf who pretended to be Red Riding Hood's Grandmother.

It is mostly the Wandering Spiders who behave in this way. It saves them trouble. For instead of hunting for their dinner, as the Wolf Spiders do, they can just sit down and wait for it to come to them, or slowly stalk their prey without being seen themselves.

The Crab Spiders are nearly all terrible humbugs; they imitate all sorts of harmless things in order to tempt flies and bees

and butterflies and beetles to settle near them. Some look just like little splashes on the leaves of the trees; others are marked to resemble lichen-covered bark; while some imitate blades of grass and different kinds

A CURIOUS SPIDER.

of flowers. These Spiders have usually rather squat bodies, and their two front pairs of legs are much longer than the hind pairs, so that they sidle along in a curious crab-like way; and this is why they are called Crab Spiders.

One of these cunning Spiders is a pretty, pale pink, just the colour of a wild orchid,

and when it takes up its favourite position on the top of a flower spike it looks exactly like an unopened bud. There it lies in wait, like a cruel ogre, for the insects that visit the orchid.

Presently a bee comes bustling near, in search of nectar to fill her honey bag. As she buzzes round the flower spike the cunning Spider keeps perfectly still—not a movement does it make to frighten the bee away. But the moment the bee has thrust its head into a flower and is busily engaged in sucking up the nectar—down drops the Spider on her back! The poor bee gives a shrill buzz of fear, and tries to sting her unseen foe. But too late. The Spider sinks its poisoned fangs into the insect and in a few moments her struggles are over. Then the Spider carries its victim down beneath the lowest flowers on the spike, and there, hidden from view by the drooping blossoms, it settles down to a hearty meal.

The ogre soon finishes its repast and is ready for more, for Spiders are terribly hungry creatures, so it drops all that is left of the poor bee on the ground, climbs the spike, tucks itself once more among the un-

opened buds and waits for another victim to come its way.

The Grass Spider is long and thin and a yellowish-green colour, so it chooses to live among the grasses, where it is almost as invisible as the Grass-stick insect you read about in the last little book on the "Wonders of Insect Life."

BRUSH-LEGGED SPIDER.

Now you know that a Spider generally stands with its legs spread fairly evenly all round it, making a rough sort of circle. But the Grass Spider does not stand like this, it has its own particular way of arranging its legs.

As it rests, with its long, thin body pressed closely against a stem of grass, the Spider stretches its two front pairs of legs straight out in front of it, while its hind legs are stretched out behind. In this position it is practically impossible to see the wily creature, it just looks like part of the stem,

for there are no little legs sticking out to give the Spider away.

Flies and little beetles come near to take a little rest on the grass without ever suspecting their enemy the Spider is close at

PECULIAR SPIDERS.

hand; then, with a sudden spring, it seizes its prey and carries it down below to feast on at leisure.

There is a little creamy white Spider that lurks amidst the buds of the wayfaring tree and the flower-heads of the wild parsley,

lying in wait unseen for the flies which visit the blossoms; and a red and yellow fellow who always chooses flowers of the same colouring for his happy hunting-grounds.

There are Spiders, too, which mimic ants and beetles, and others that are covered with spikes and lumps or are such extraordinary shapes that they look like anything but Spiders, and are often mistaken for thorns, seed-pods, dried knots of wood, or curious shells—in fact, there is no end to the wily ways of these cunning creatures.

I do not, of course, mean to tell you that the Spiders actually turn themselves into these queer shapes — they are made that way. But they are clever enough to take every advantage of their peculiar appearance, and are always to be found in some situation where they will not be easily noticed.

Ordinary-looking Spiders have other ways of protecting themselves. Many drop at once to the ground if they are frightened, and if touched will curl up their legs and pretend to be dead; and some Spiders, if they are sitting in the middle of their webs and have no time to escape, clutch the

threads firmly with their claws and swing themselves rapidly backwards and forwards. Faster and faster they go, and in a few seconds, to their enemy's astonishment, Spider, web, and all have disappeared.

CHAPTER X

"STINGING-TAIL" AND "HUNDRED-LEGS"

FEW creatures, I suppose, bear a much worse character than the Scorpion. And certainly he does look an alarming sort of creature with his great pincer-claws, and his long, stinging tail that he is always flourishing over his back as much as to say "touch me if you dare!" And very few creatures *do* dare to meddle with a Scorpion—whether they walk on two, four, six, or eight legs as Mr Scorpion does himself. He is a most unpopular little beast with everyone all round, and so is generally left severely alone.

Yet, like many other alarming-looking creatures, the Scorpion is not quite so ferocious as he appears to be. To be sure he can and will sting if he is interfered with,

and his sting is exceedingly painful; but the Scorpion is actually rather timid and retiring in his ways, and half the time when he is snapping his claws and lashing his tail he does it because he is frightened himself, and wants to scare you away and slink off and hide himself under a stone.

Scorpions cannot bear strong light, so they pass the day in some dark or shady corner—under stones or wood, holes in the rocks, or sometimes in pits which they dig in the sand with their strong legs. Then as soon as the sun has set they leave their hiding-places and prowl about in search of prey. They run quickly here and there, peering about in a short-sighted way (for, like most Spiders, Scorpions have not very good eyesight), with their queer-looking tails curled over their back or sweeping the ground behind them, and their curious pincer-claws held straight out in front of them ready to seize the first poor victim they chance to meet.

Insects and Spiders are the favourite food of these peculiar creatures; but, unless it happens to be big and strong, a Scorpion will not trouble to sting its prey, it just

THE SCORPION.

nips it with its claws, and slowly devours it in a way that reminds us of an old crab eating its dinner. If, however, the Scorpion has captured a big, fierce Spider, who shows fight and threatens her assailant with her fangs, up comes the terrible tail, and the poisoned dart is plunged beneath the bold Spider's skin.

Their habit of hiding themselves away in all sorts of odd places is one reason why Scorpions are so much dreaded and disliked in the hot countries they inhabit. They sometimes crawl into houses, and get into the beds, or creep into peoples' boots and shoes; and, really, it *must* be unpleasant to find a thing of this sort under your pillow at night, and startling and painful when you put your shoes on in the morning to be stung in the toe by a spiteful little Scorpion!

Painful as it is, however, the sting of a Scorpion is not quite such a dreadful thing as most people imagine. It is not deadly (except to little insect folk and other small creatures), though it may sometimes cause sickness if the person stung is not in a good state of health. But Scorpions never sting

unless they are annoyed or set upon by other animals. They don't want to fight, but are quite ready to defend themselves with tail and claw if any creature is bold enough to attack them; and now and then two male Scorpions will have a difference of opinion, if they both want the same mate or the same thing for dinner, and then a regular pitched battle takes place between the rivals.

Their manners are extremely polite to the lady Scorpions, however, and it is the funniest sight to see the behaviour of a pair of these strange creatures who are thinking of setting up house-keeping together. They stand face to face and bow, curving their tails over their backs and twining them affectionately together. Then the gentleman clasps both his partner's claws in his own and walks slowly backwards, while the lady follows him with raised and curling tail. Hand in hand they promenade in this way for an hour or more, and then Mr Scorpion digs a hole in the sand and together they take possession of their new home.

But, sad to say, the married life of Mr and Mrs Scorpion, that starts in such a pleasant

friendly way, too often ends in tragedy. The lady Scorpion is a fierce and fickle creature, and much the bigger of the two. So if she grows tired of her mate, or he annoys her in any way, she treats him as the Diadem Spider treats *her* little partner and eats him up for dinner. Yet the Scorpion, like the Spider, is a very kind mother, and allows her little ones to ride about on her back for some time after they are born.

The Scorpions are related to the Spiders, although you might hardly think so from their appearance; they look much more like a peculiar kind of lobster with their great pincer-claws; yet if we look carefully at a Scorpion we shall see that it is like the industrious little spinners in more ways than one.

A Scorpion's head and shoulders are not distinct one from another, but are soldered together just as a Spider's are; and it has the same number of legs—eight. For its pincer-claws are not legs; they take the place of the Spider's palps.

The largest Scorpions are found in Africa and in India, and are often nine inches long. The natives are very much afraid of these great creatures, and call them "man-

killers "—but, of course, they do not really kill men. The little black European Scorpions are not nearly so alarming; most of them are only about an inch and a half or two inches long, though some are a little larger.

There are several other eight-legged

A WHIP-SCORPION.

creatures that are related to the Spiders and the Scorpions. One of these is the little Whip-scorpion found in Asia and some parts of America. It is a funny-looking little thing an inch or two long, and has a fine pair of crushing claws and a long, thin

tail like a whip. It lives under stones or fallen tree-trunks, and feeds on insects which it crushes with its strong pincers.

In hot parts of the world, too, live the curious "false spiders." They are so very flat that they can squeeze themselves under

A FALSE SPIDER.

stones or the loose bark of fallen trees or into the smallest crack in a rock. They look more like Spider-crabs than anything else, and they have a most extraordinary pair of long arms ending in little claws and covered with stiff short spines, which take the place of the Spider's palps and the Scorpion's pincer-claws. These queer creatures feed on insects, which they seize with their long arms when they wander near their lurking places.

The queer long-legged "Harvest-man," with its little round button of a body, is another relation of the Scorpions and the Spiders—but it is not a true Spider as many people think. Its habit of coming into the house and running with great speed over the walls on its ridiculous long legs has made the little Harvest-man rather unpopular, but he will do you no more harm than a Daddy-long-legs.

A QUAINT LITTLE HARVESTMAN FROM ABROAD.

All Harvest-men are not so brisk and nimble; some that live in the grass are slow-going creatures and move about as if their long, thin legs were too weak to bear them. They are useful little creatures in the garden as they feed on all sorts of tiny, troublesome insects, and they are very thirsty folk, fond of sipping the dewdrops on the grasses. Some of their foreign relations are even more peculiar-looking, as you will see if you look at the portrait of a quaint little

Harvest-man who flourishes in South America and some parts of Europe.

One would imagine that eight legs were quite as many as any creature could manage comfortably; but those strange little animals the "Hundred-legs," that you often find under stones, or wriggling about in the mould when you dig in the garden beds, seem to think it a case of "the more the merrier"; for they and their cousins the "Thousand-legs" rejoice in a greater number of legs than any other land creature, large or small.

The "Hundred-legs" are usually called "Centipedes" (which, of course, means exactly the same thing), but this name is not altogether an accurate one, for although certain members of this peculiar family possess as many as 173 pairs of feet, those with which we are best acquainted can boast only 17 or 21 pairs apiece.

The Centipedes are an extremely hardy race. They are to be found in nearly all parts of the world, and seem to flourish equally well in hot countries and in cold countries, in good rich soil and in barren land. They are all sizes, from tiny things that we can hardly see without a magni-

fying glass to huge monsters nearly a foot in length. These giant centipedes are found in South America and the West Indies, and they are really dangerous things, as

CENTIPEDES.

their bite is extremely poisonous; but the tales sometimes told of monster centipedes over a yard long, I am afraid we must dismiss as "travellers' yarns."

Some of these many-legged creatures are long and thin, and some are short and stout, but whether it is long or short a centipede's body is always made up of a number of

rings (or segments), and there is a pair of legs on each ring. As a rule they are ugly, dull-looking things, either black or the colour of rusty iron, but some of the foreign centipedes are gorgeous creatures streaked with bright and pretty colours; and there are some that shine with a brilliant phosphorescent light, and as they wriggle along in the darkness leave a glowing path behind them.

Centipedes in our country are rather useful little creatures, as they feed on insects, and so help to keep down the pests of the farm and garden. They are very quick and active, and run very fast, zig-zagging over the ground as they hunt about for something to eat. Just beneath the mouth they have a strong pair of poison claws with which they nip their prey in the most ferocious manner, and they sometimes fight most savagely among themselves.

The male Centipede, too, is something of a cannibal, and poor mother Centipede has a great deal of trouble in protecting her eggs from her unnatural, greedy mate, who is always prowling round trying to gobble them up. So as soon as an egg is laid,

mother Centipede clasps it with two little hooks which she has under her tail, and runs off with it as fast as she can; then, when she is at a safe distance from her troublesome mate, she rolls the tiny egg, which is very sticky, round and round in the mould till it looks like a little mud pill, which no one, not even a greedy Centipede, would feel inclined to eat.

"Thousand-legs," or Millipedes, are rather troublesome things. They have no poison claws and prefer vegetable food, so are often very destructive to crops. They have two pair of legs on every body ring, and by this you may know them from the Centipedes, which have only one. Yet although they have twice as many legs, Millipedes do not run about twice as fast as their cousins the Centipedes do, but move along slowly in a graceful, wave-like fashion, and if they are disturbed, generally curl themselves up instead of running away; so I suppose swiftness of foot does not depend on the number of legs one has.

Some Centipedes can move backwards almost as fast as forwards, but exactly *how* these curious creatures walk, and in what

order they move their many legs, has puzzled many people.

"A Centipede was happy quite
Until a toad in fun
Said, 'Pray, which leg moves after which?'
This raised her doubts to such a pitch,
She fell exhausted in the ditch,
Not knowing how to run."

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